



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/766,151	01/19/2001	Terry M. Turpin	509622000400	1278
25227	7590	11/08/2005	EXAMINER	
MORRISON & FOERSTER LLP 1650 TYSONS BOULEVARD SUITE 300 MCLEAN, VA 22102			WILSON, ROBERT W	
			ART UNIT	PAPER NUMBER
			2661	

DATE MAILED: 11/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

J

Office Action Summary	Application No. 09/766,151	Applicant(s) TURPIN ET AL.	
	Examiner Robert W. Wilson	Art Unit 2661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9-13 is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Claim Rejections - 35 USC § 103

1.0 The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2.0 Claims 1-3 & 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seo (U.S. Patent No.: 6,222,833 B1) in view of Garcia (U.S. Patent No.: 5,724,162)

Referring to claim 1, Seo teaches: a receiver (communication system) for multi user (Abstract or per col. 1 line 39) detection per Figs 1 & 2.

The reference teaches a plurality of processors each of which multiplies S subscript $K(t)$ with $r(t)$ and integrates for time period T which is performing correlation per Figs 1 & 2. $r(t)$ represents multiple users signals per Abstract or per col. 1 line 39 and S subscript $K(t)$ represents spreading codes per col. 1 lines 44-45 (hypothesized signals). The plurality of correlators produces a plurality of correlations (processor for correlating)

Each of the correlators is a one dimensional correlator. The plurality of correlators produce a vector of outputs or a multi-dimensional output array. The dimension of the vector has a dimension based upon the S subscript $K(t)$ (dimension based upon hypothesis) and a second dimension associated with $r(t)$ (dimension based upon correlation results)

11 per Fig 1 or 21 per Fig 2 performs a receiver algorithm for identifying sorting and separating the plurality of received signals based upon the plurality of correlations (algorithm) which results in interference being reduced per col. 1 line 14 or col. 2 lines 36-67.

Seo does not expressly call for: an optical correlator but teaches a correlator per Figs 1 & 2 respectively.

Garcia teaches: an optical correlator per Abstract or col. 1 lines 32-36.

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the optical correlators of Garcia in place of the correlators of Seo because the optical correlators are faster and more cost effective to implement.

In Addition Seo teaches:

Art Unit: 2661

Regarding claim 2, The spreading codes S subscript $K(t)$ vary with time. It would have been obvious to one of ordinary skill in the art at the time of the invention that a controller is required in order to vary the codes with time.

Regarding claim 3, The reference teaches a plurality of correlators which when implemented together generate a two dimensional output correlation matrix per Figs 1 & 2.

Regarding claim 5, The reference teaches that interference is decreased per abstract. It would have been obvious to one of ordinary skill in the art at the time of the invention that because interference is another name for noise and the interference has been reduced that the signal to noise ratio would be enhanced.

Regarding claim 6, The reference teaches this is used to detect signals from multi users per Abstract or per col. 1 line 39)

Regarding claim 7, The applicant does not define what a multi user receiver algorithm is in the claim. The reference teaches that the Figs 1 & 2 are used to receive signals from multi users per Abstract or per col. 1 line 39; therefore, the examiner interprets this as a multi user receiver algorithm.

Regarding claim 8, The reference teaches that the system is a direct sequence spread spectrum CDMA or DS-CDMA receiver for multiple users per Abstract

3.0 Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Seo (U.S. Patent No.: 6,222,833 B1) in view of Garcia (U.S. Patent No.: 5,724,162) further in view of Bloom (U.S. Patent No.; 5,311,360)

Referring to claim 4, the combination of Seo and Garcia teaches: The system of claim 1,

The combination of Seo and Garcia does not expressly call for: comprising a converter for converting the plurality of received signals into a form suitable for input to the optical processor

Bloom teaches: modulator which converts electrical to optical signals per col. 1 lines 16-35.

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the converter from electrical to optical signals of Bloom to the Optical correlator of the combination of Seo and Garcia because according to Bloom it is well known in the art to utilize the modular in conjunction with optical correlators for signal conversion.

Allowable Subject Matter

4.0 The present invention is directed to a method of reducing interference in a multiple user communication system comprising receiving a plurality of signals, optically correlating at least one of the plurality or received signals simultaneously against a plurality of hypothesized signals to generate data comprising a plurality of correlations, the step of optically correlating comprising configuring at least a one-dimensional optical correlator to produce an output comprising a multi-dimensional output array having a first dimension and a second dimension, the first dimension associated with a hypothesis and the second dimension associated with a correlation result”

The closest prior art is Seo (U.S. Patent No.; 6,222,833) and Garcia (U.S. Patent No.; 5,724,162). The combination teaches: a method of reducing interference in a multiple user communication system comprising receiving a plurality of signals, optically correlating at least one of the plurality or received signals simultaneously against a plurality of hypothesized signals to generate data comprising a plurality of correlations, the step of optically correlating comprising configuring at least an optical processor comprising one dimensional correlators which output a multidimensional output array. The combination of Seo and Garcia do not either singularly or in combination anticipate or render obvious the following claim limitation: “ the step of optically correlating comprising configuring at least a one-dimensional optical correlator to produce an output comprising a multi-dimensional output array having a first dimension and a second dimension, the first dimension associated with a hypothesis and the second dimension associated with a correlation result” as claimed in claim 9.

Art Unit: 2661

In addition:

Claims 10-13 are allowed because they depend upon claim 9.

Response to Amendment

5.0 Applicant's arguments filed 10/18/05 have been fully considered but they are not persuasive.

The examiner respectively disagrees with the applicant argument that the combination of the references Seo and Garcia fail to teach "at least one optical processor for correlating at least one of a plurality of received signal simultaneously against a plurality of hypothesized signals to generate data comprising a plurality of correlations." 10 per Fig 1 or 20 per Fig 2 is the processor that has a plurality of correlators (I subscript 1 through I subscript k). Each of the correlators are one dimensional but together the correlators in the processor output a vector which is more than one dimensional. The output of the processor is $(1 \times K)$ which has more than one dimension. The examiner has interpreted that one dimension of the output is output based upon hypothesis and the other dimension is based upon correlation.

Garcia teaches: an optical correlator per col. 1 lines 32-36. It would have been obvious to one of ordinary skill in the art at the time of the invention to add the optical correlators of Garcia in place of the correlators of Seo because the optical correlators are faster and more cost effective to implement.

The examiner respectively disagrees with the applicant's argument that there is a claim limitation "to scan or otherwise search for proper alignment of the spreading code" ; therefore, this argument is not relevant to the claimed invention.

Art Unit: 2661

Conclusion

6.0 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert W. Wilson whose telephone number is 571/272-3075. The examiner can normally be reached on M-F (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau T. Nguyen can be reached on 571/272-3126. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Robert W Wilson
Examiner
Art Unit 2661



**BOB PHUNKULH
PRIMARY EXAMINER**

RWW
10/2/05